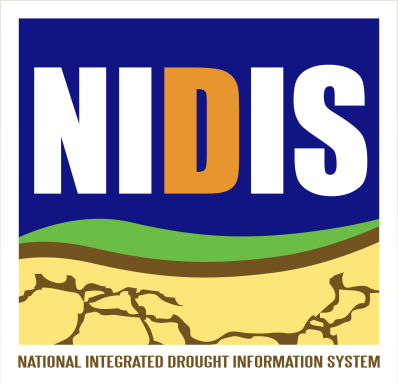
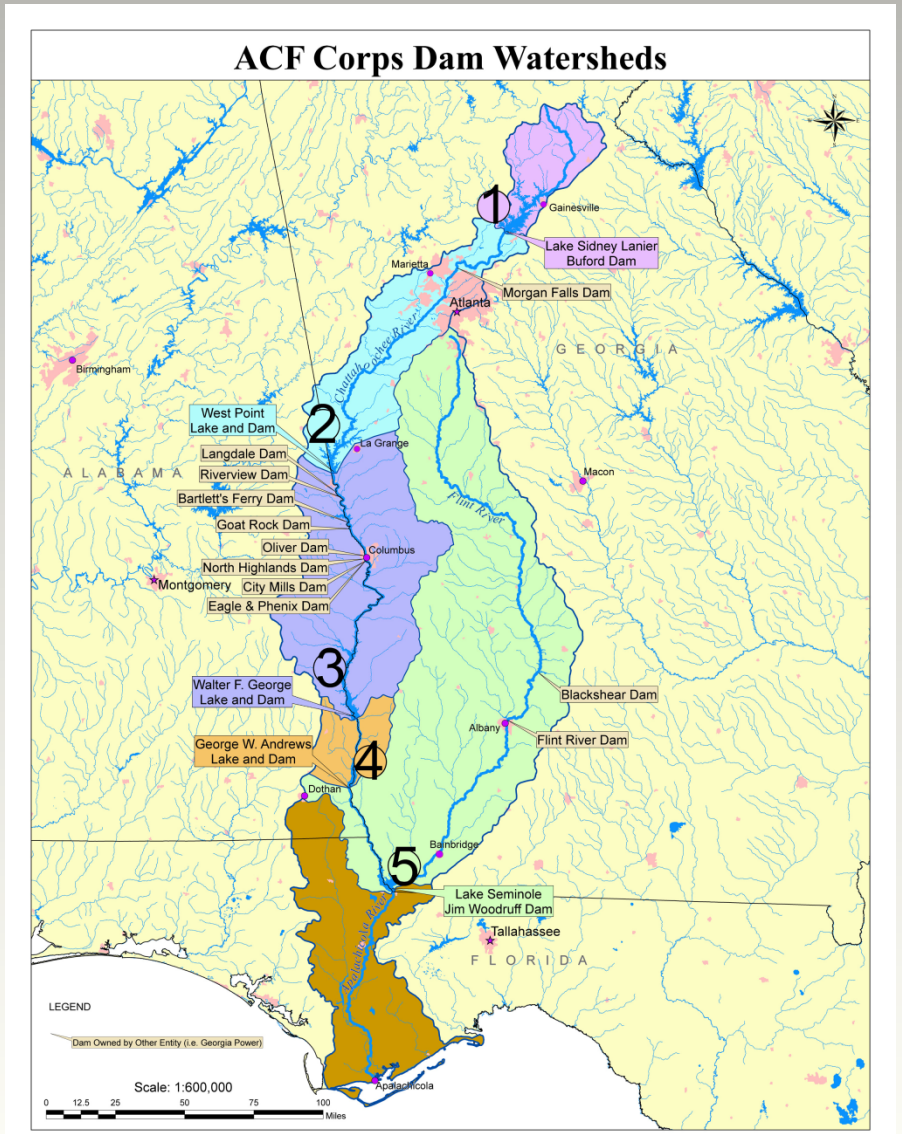
Apalachicola-Chattahoochee-Flint (ACF) River Basin: NIDIS Drought Early Warning Information System

Co-Leads: Lisa Darby and Chad McNutt

NOAA/NIDIS Program Office

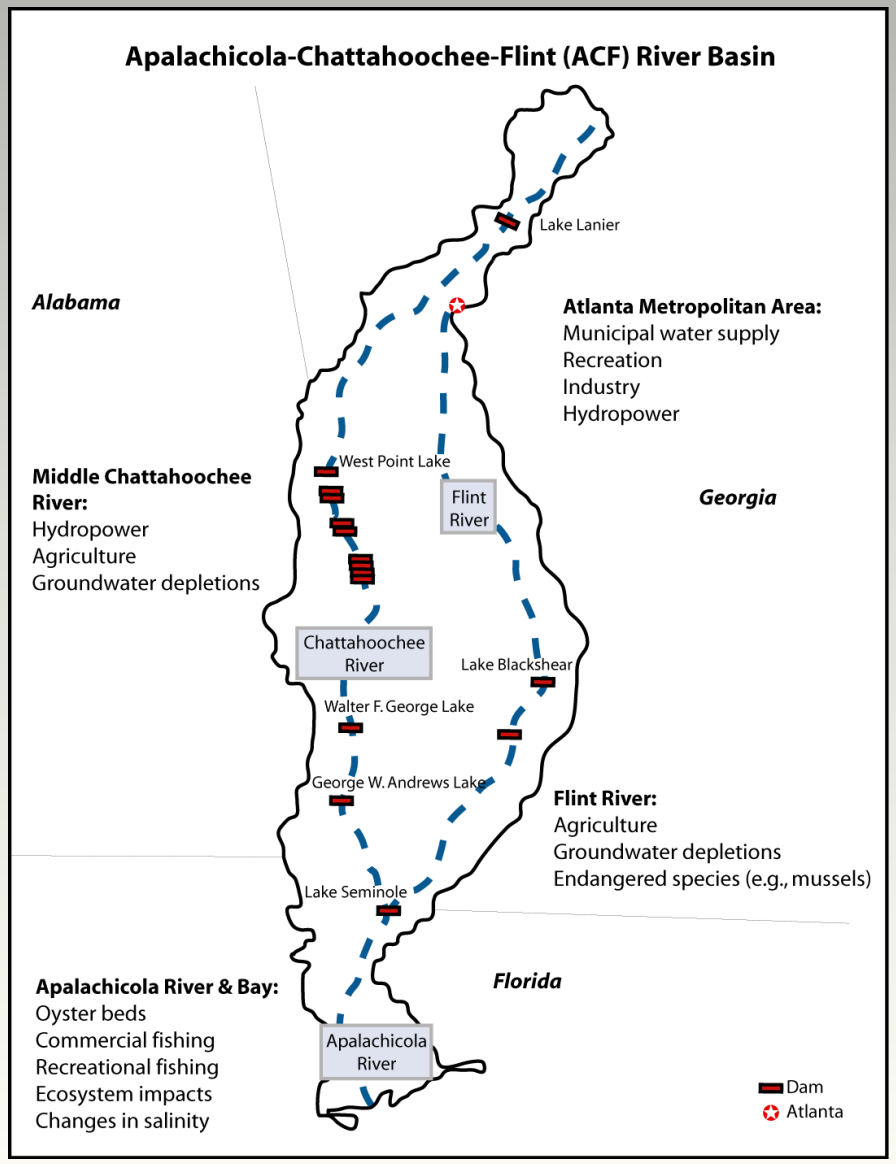


ACF Basin - Background



- 5 Corps-operated dams
- 11 Dams owned and operated by power companies
- Buford Dam constructed for
  - Flood control, hydropower, navigation
- At least 20 years of litigation regarding allocation of water in the basin
  - Multi-District Litigation
  - July 2009 Magnuson Ruling
    - The Corps of Engineers should have obtained congressional approval before allowing Atlanta to withdraw water from Lake Lanier for the Metro Atlanta water supply
    - The parties have 3 years from this ruling to obtain Congressional approval to reallocate the water or agree to some other resolution
    - In the absence of a resolution, Buford Dam operations will revert to the baseline operations of the mid-70s
  - July 2010 Magnuson dismissed Florida's argument to use the Endangered Species Act to dictate water flow into the Apalachicola

Water Supply-Related Vulnerabilities



The NIDIS Way

- Identify appropriate partners and stakeholder representatives
- Set goals and priorities; involve partners in problem definition
- Use professionals from relevant agencies etc. to build common ground
- Produce collectively authored gaps assessments and agreement on the way forward
- Build longer term collaborative partnerships
- Determine tradeoffs: Decision quality vs decision acceptability

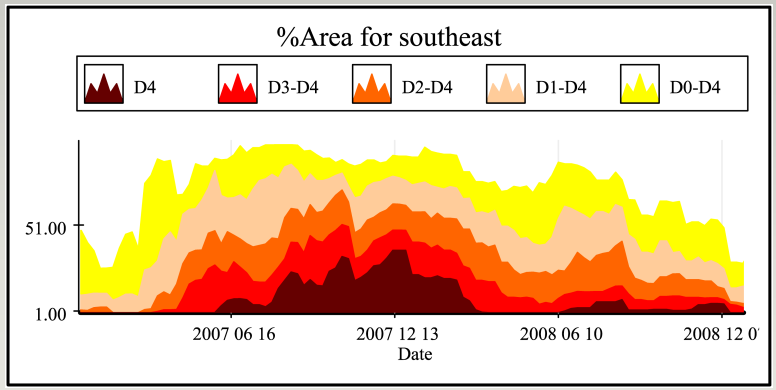
The ACF Drought Early Warning Information System (DEWS):
Implementing the Process

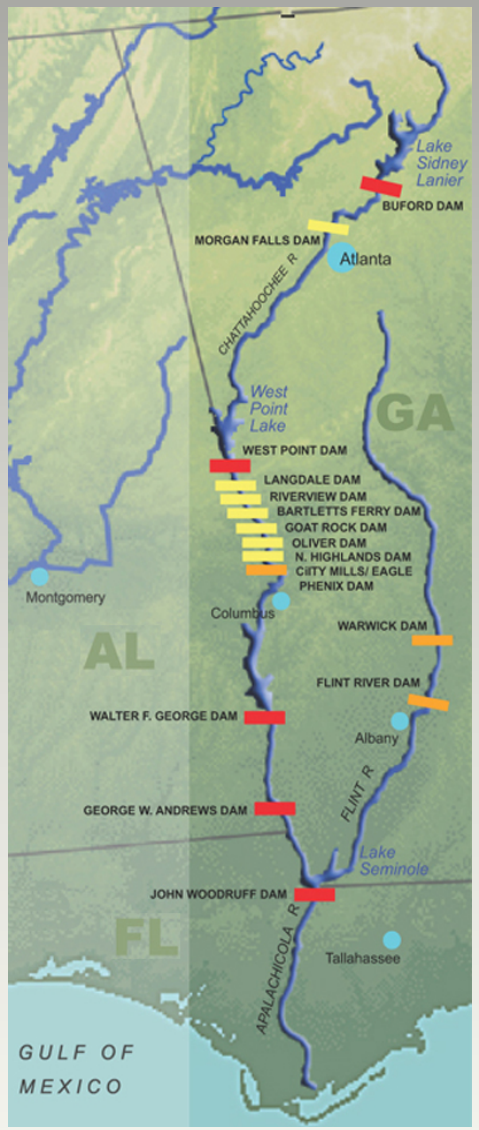
Small Planning meetings – What are the issues and who are the players?

Full-basin Scoping Workshop: Lake Blackshear (Dec. 2009)

KEY ISSUES:

Gaps in understanding
Gaps in measurements
Presentation of information
Education
Drought Indicators
Forecasting





Upper Chattahoochee (Aug 2010)

Middle Chattahoochee & Flint (May 2010)

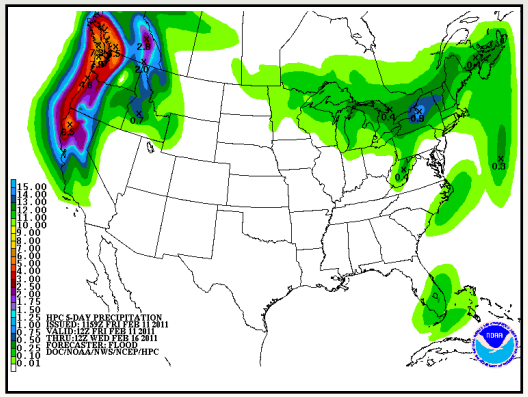
Apalachicola River & Bay (April 2010)

GOOD NEWS: There were common concerns among the stakeholders in all parts of the basin that could be addressed by a regional drought early warning information system

Commonalities among the three sub-basins

- ***Education and Communication***
  - People across the basin agree that education and communication regarding drought needs improvement
    - General public, lawmakers, politicians
    - Examples: Upstream vs. downstream issues or the results of water conservation efforts
  - Drought information needs to come from a trusted source in an easy-to-understand way

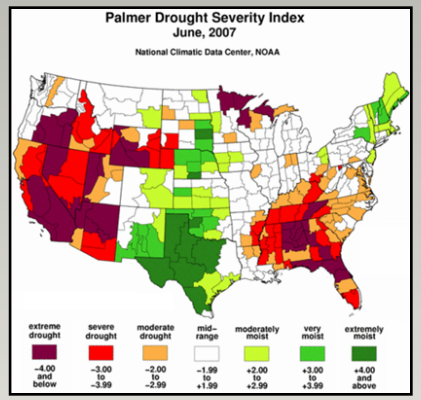
- ***Forecasting improvements***
  - Improved precipitation forecasts, especially for the recharge season
  - Better forecasting for transitioning into and out of drought
  - Finer spatial resolution
  - Better longer-term forecasts
  - Simplified explanations of products
  - Better forecasting of extreme events



Commonalities among the three sub-basins

- ***Improved interactions with the Corps***
  - Input into water control manual
  - Data sharing
  - Communication
- ***Data***
  - Improved dissemination
  - Appropriate calibration and quality control
  - Access to real-time data (of all kinds…)
  - Soil moisture (in-situ, remote sensing, modeled)
  - Reservoir storage
  - And much much more…
- ***Consistency in drought planning among the three states***
  - Common restrictions near state borders
  - Common set of declarations and responses
  - Decisions based on common data sets

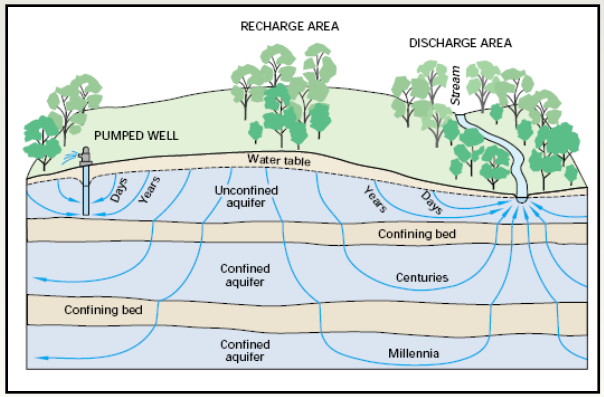
Commonalities among the three sub-basins



- ***ACF Basin webinars and Climate Outlooks***
  - What are the current conditions?
  - What are the projections?
  - What are the current and anticipated impacts?
- ***Drought Index***
  - Can a basin-wide drought index be established?
    - Something analogous to the Surface Water Supply Index (SWSI) used in the western states
    - Indices for the beginning and ending of a drought
    - Sector-specific indices
    - Indices for the different types of drought (e.g., meteorological, agricultural and hydrological)

Commonalities among the three sub-basins

- ***Resolve discrepancies in our understanding of groundwater***
  - How much groundwater is withdrawn?
  - How frequently should withdrawals be recorded?
  - Improved modeling
  - Improved access to data
- ***Presentation of Information***
  - Basin-scale graphics available from one web site
  - Historical context/analog years
  - Can we get away from climate divisions?



Full-basin Climate Outlook Forum and DEWS Priorities – Albany, GA (Nov 2010)
Establish committees to carry out the DEWS priorities

Lake Blackshear

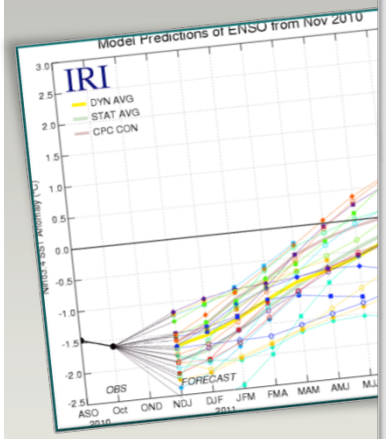
Albany, GA

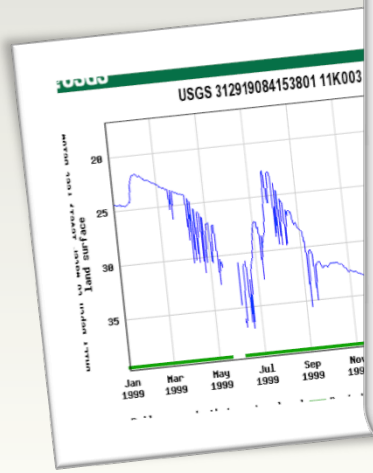
Callaway Gardens, GA

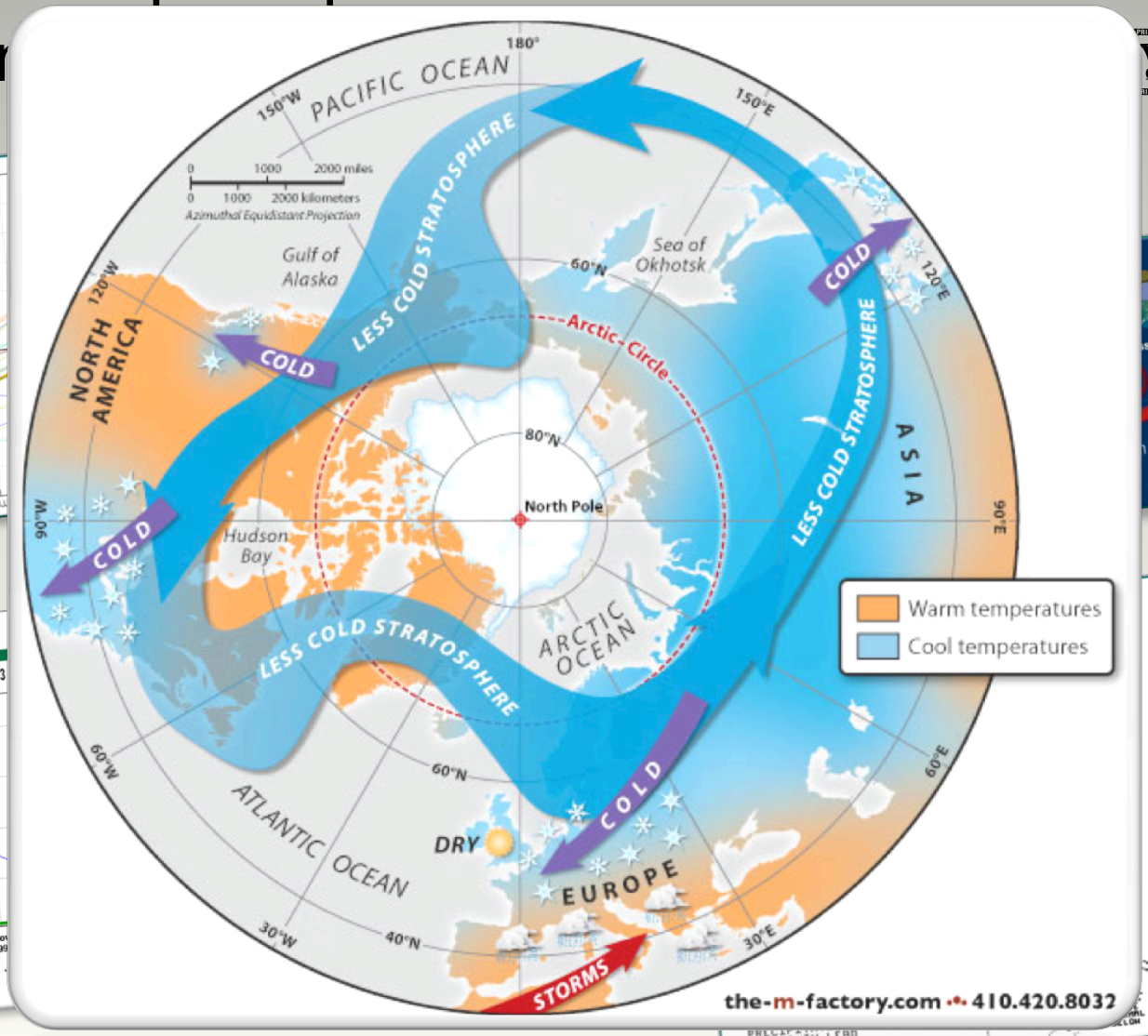
Apalachicola, FL

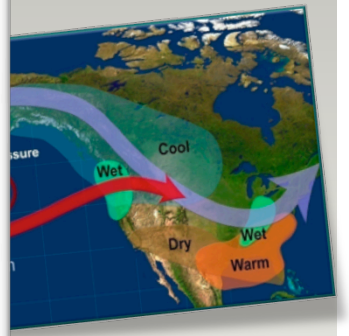
Stone Mountain, GA

Climate Outlook Forum – Albany, GA (Nov 2010): Local and national experts presented current conditions, outlooks ar a



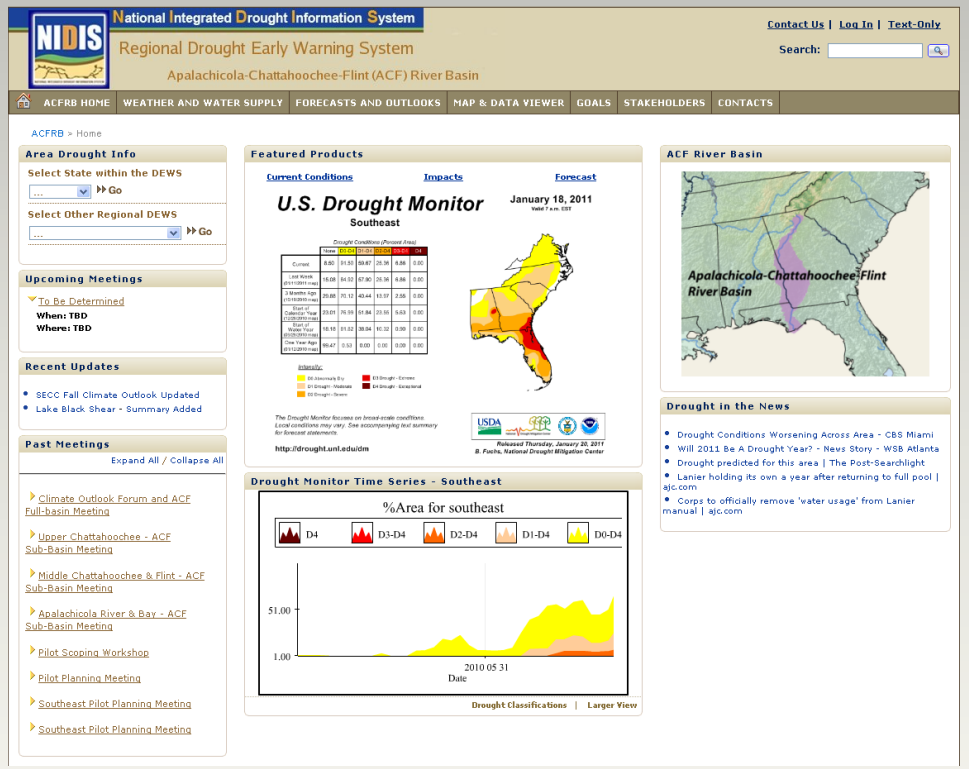






DEWS Priorities and Committees
Top Priorities/Committee Leaders

- ***Education and Communication***
  - Led by Christopher Martinez, Univ. of Florida
- ***ACF Basin webinars and Climate Outlooks***
  - Led by Keith Ingram, Univ. of Florida
- ***Data & Presentation of Information***
  - Led by Pam Knox, Univ. of Georgia



ACF Basin web page on www.drought.gov

First Steps

- **Production of our first fact sheet - "What does the 2010-2011 La Niña mean for the Southeastern US?"**
  - Disseminated to stakeholders on 2/4/11
- **ACF Basin Weather and Climate Briefings – early stages**
  - Products
  - Timing
- **ACF instream flow study**
- **Pre-planning stages for media training for local reporters**
- **Data Committee**
  - Continuing with the ACF data inventory

SOUTHEAST CLIMATE CONSORTIUM

What does the 2010-2011 La Niña mean for the Southeastern USA?

An Apalachicola-Chattahoochee-Flint River Basin Drought Early Warning System Fact Sheet

Prepared by Christopher J Martinez[1] for the Southeast Climate Consortium (SECC) and the National Integrated Drought Information Service (NIDIS). January 2011.

[1] *Department of Agricultural and Biological Engineering, University of Florida, P.O. Box 110570, Gainesville, FL 32611, (352) 392-1864 x279, chrisjm@ufl.edu*

La Niña typically brings warmer and drier conditions to the Southeastern USA during winter, resulting in reduced streamflow, lower reservoir and lake levels, and greater risk of wildfire. La Niña events can last one or more years. In multi-year La Niña events, there is a greater likelihood for successive winters to be warmer and drier than normal.

The winter of 2010-2011 has been colder than would be expected during a La Niña, with some locations in the Southeastern USA recording the coldest December on record. This unusually cold weather has been caused by the North Atlantic Oscillation (NAO), which has effectively overpowered La Niña for much of this winter. However, the condition of the NAO can change in a manner of a week or two, while La Niña conditions are expected to continue through the spring.

The purpose of this document is to describe the 2010-2011 La Niña, the impact the NAO has had this winter, and the potential impacts of La Niña for the remainder of the winter and through the spring.

What Is La Niña?

La Niña is a cooling of the surface of the eastern and central Pacific Ocean along the equator and is part of the climate phenomenon known as the El Niño-Southern Oscillation (ENSO). Periods of warming of the eastern and central tropical Pacific are known as El Niño. The change in heating and cooling of the ocean caused by El Niño or La Niña cause changes in the atmosphere in the tropical Pacific, which in turn impacts atmospheric circulation in many regions of the world.

El Niño and La Niña events tend to occur every 3-7 years. Periods where the tropical Pacific Ocean is neither warmer nor cooler than usual are called Neutral. El Niño events may last for a period of a few months up to one year (though multi-year events have occurred in the past), while La Niña events have a greater tendency to continue for multiple years (Figure 1). The La Niña events in 1954-1957, 1973-1976, and 1998-2000 are examples of past multi-year events.

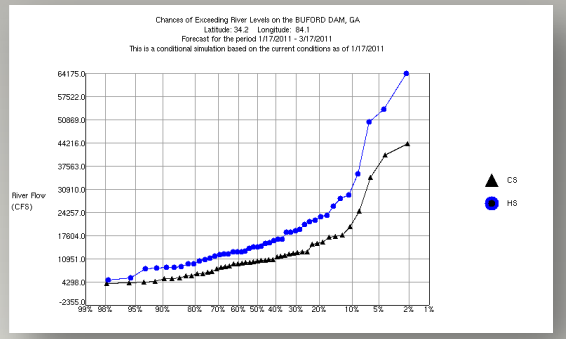
Figure 1. The Multivariate ENSO Index (MEI). La Niña events are indicated by large, negative values of the index and El Niño events as large, positive values. The MEI is essentially a weighted average of the significant features related to ENSO over the tropical Pacific and includes the following six variables: sea-level pressure, the east-west and north-south components of the surface wind, sea surface temperature, surface air temperature, and total amount of cloudiness. Details of the MEI can be found at: http://www.esrl.noaa.gov/psd/people/klaus.wolter/MEI/mei.html

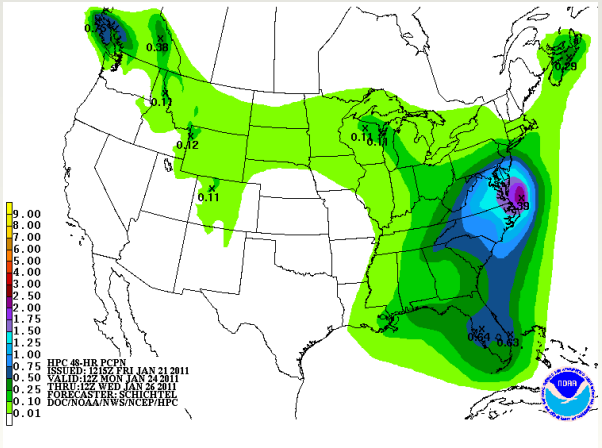
Southeast Climate Consortium
SEClimate.org

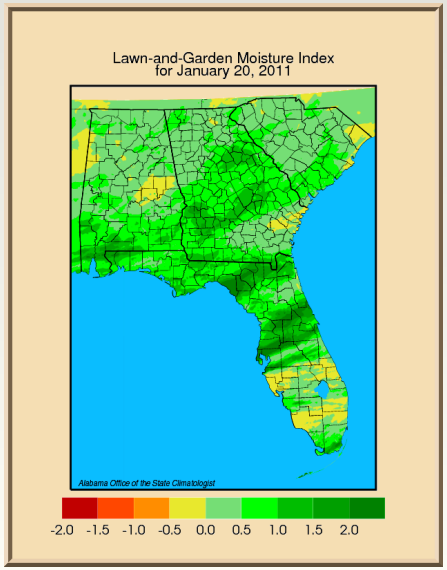
NIDIS

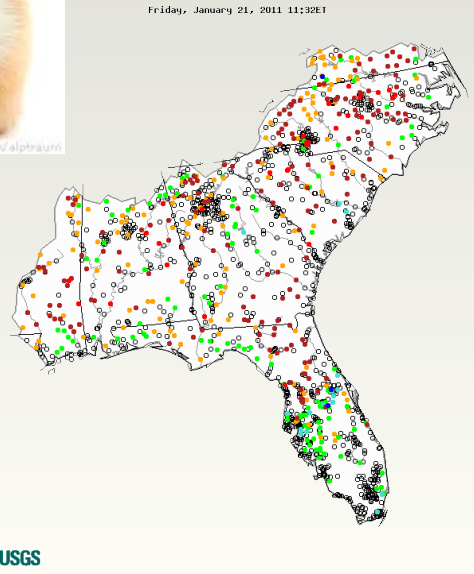
ACF Basin Weather and Climate Briefing

- SECC RISA
- 3 State Climatologists
- USGS
- GA Environmental Protection Division
- NW FL Water Management District
- AL Department of Water Resources
- NWS S. Region
- SERFC
- S. RCSD
- SERCC
- ACF-S
- Habersham County Water Authority



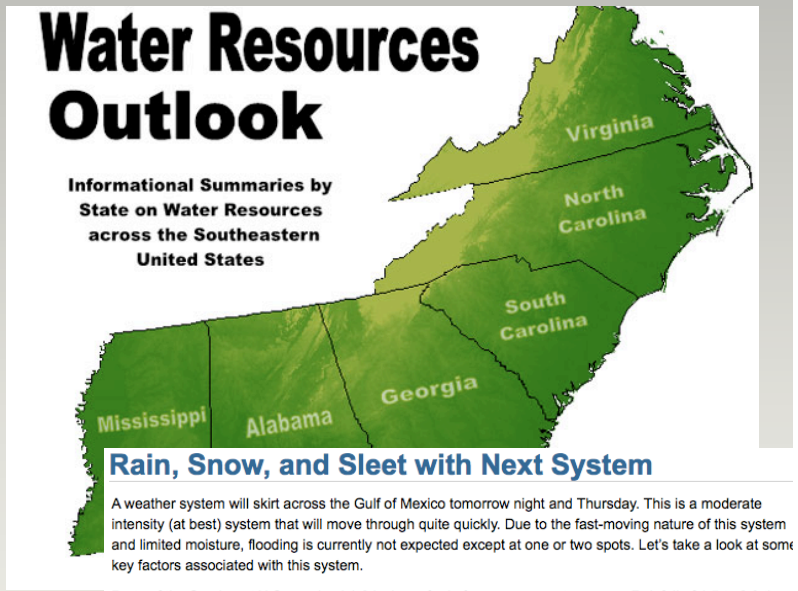






ACF: A lot is already underway

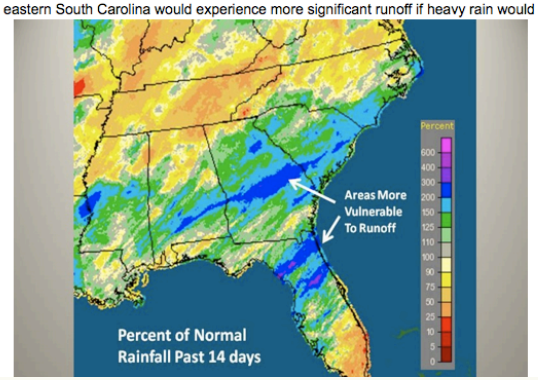
- USACE Drought Briefings
- Southeast RFC
  - Water Resources outlook
  - SE Journal
- GA EPD/GA SC
- AL-OWR Drought groups
- FL-Unified Assessment (drought monitor discussion group)
- Flint River Protection Act



Rain, Snow, and Sleet with Next System

A weather system will skirt across the Gulf of Mexico tomorrow night and Thursday. This is a moderate intensity (at best) system that will move through quite quickly. Due to the fast-moving nature of this system and limited moisture, flooding is currently not expected except at one or two spots. Let's take a look at some key factors associated with this system.

Parts of the Southeast U.S. received 1-3 inches of rain from recent past systems. Rainfall of 1.5 to 2.0 times normal are indicated in blue. These areas, which include parts of southern Alabama and Georgia, North Florida, and eastern South Carolina would experience more significant runoff if heavy rain would occur.



Challenge – How to avoid duplication, maximize efforts and bring the three states together to handle drought in the basin

NIDIS-Supported Efforts in the ACF River Basin: Southeast Climate Consortium

Regional Integrated Sciences & Assessments (RISA)

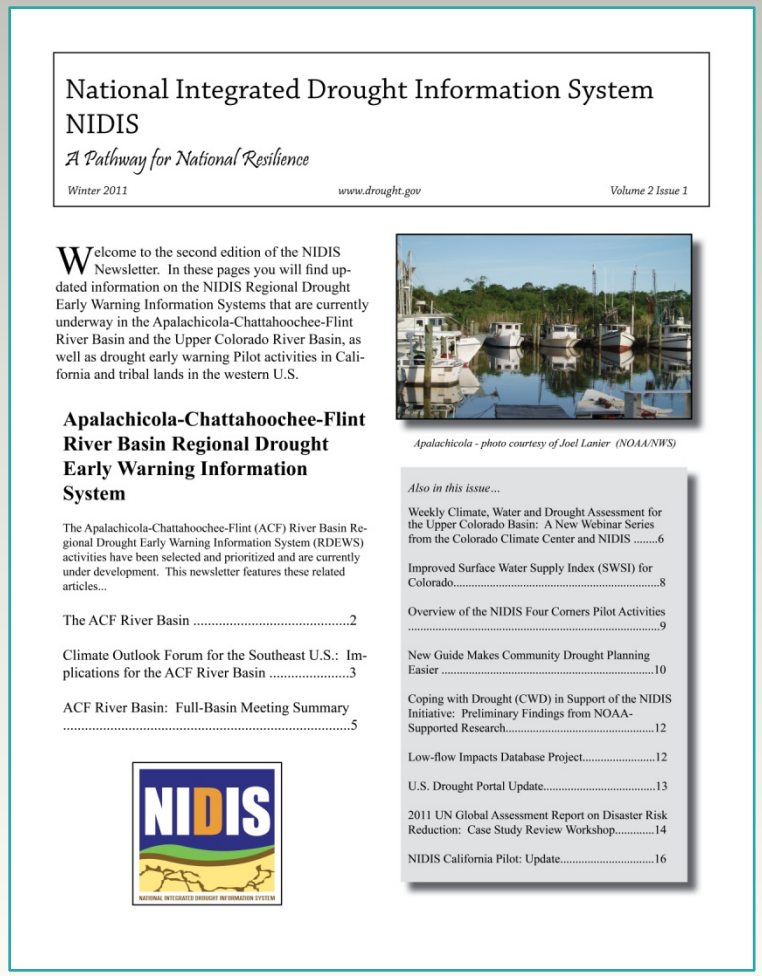
Reducing Drought Risks in the Southeast USA: Quantification of Drought Information Value, Development of Drought Indices, and Communication of Drought Information

Puneet Srivastava (PI), Latif Kalin, Keith Ingram, David Stooksbury, Pam Knox, Jessica Bolson, Muthuvel Chelliah, Richard Marcus, and Matt Dunn

Needs, Uses, Perceptions, and Attitudes towards Weather and Climate Forecast Information by Water Resource Managers in the Southeastern United States

Chris Martinez (PI), Norman Breuer, Jessica Bolson, Jim Jones, David Stooksbury, and Tatiana Borisova

Latest NIDIS Newsletter: download from www.drought.gov



National Integrated Drought Information System
NIDIS
A Pathway for National Resilience

Winter 2011 *www.drought.gov* *Volume 2 Issue 1*

Welcome to the second edition of the NIDIS Newsletter. In these pages you will find updated information on the NIDIS Regional Drought Early Warning Information Systems that are currently underway in the Apalachicola-Chattahoochee-Flint River Basin and the Upper Colorado River Basin, as well as drought early warning Pilot activities in California and tribal lands in the western U.S.

Apalachicola-Chattahoochee-Flint River Basin Regional Drought Early Warning Information System

The Apalachicola-Chattahoochee-Flint (ACF) River Basin Regional Drought Early Warning Information System (RDEWS) activities have been selected and prioritized and are currently under development. This newsletter features these related articles...

NIDIS

NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

Apalachicola - photo courtesy of Joel Lanier (NOAA/NWS)

Also in this issue...

Photo courtesy of Joel Lanier (NWS)

Thank you!

ACF Basin Stakeholders

ACF Stakeholders, Inc.
Alabama Department of Environmental Management
Alabama Office of Water Resources
Apalachicola National Estuarine Research Reserve
Apalachicola Riverkeeper
Auburn University
Centers for Disease Control and Prevention/National Center for Environmental Health
City of Apalachicola, FL
City of Clarkesville, GA
Environmental Protection Agency
Flint River Water Policy Center
Florida Department of Agriculture and Consumer Services
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
Florida Sea Grant Extension/Franklin County
Florida State University
Georgia Environmental Protection Division
Georgia Tribe of Eastern Cherokee
Golder Associates
Gwinnett County, GA
Habersham County (GA) Water Authority
Joseph W. Jones Ecological Research Center
LaGrange, GA
MeadWestvaco Corporation
Middle Chattahoochee Water Coalition
Muscogee Nation of Florida
National Drought Mitigation Center, University of Nebraska
NOAA/Climate Prediction Center
NOAA/Climate Program Office
NOAA/Coastal Service Center
NOAA/Earth System Research Lab
NOAA/National Climatic Data Center
NOAA/NIDIS Program Office
NOAA/NWS Southern Region Climate Services
NOAA/NWS/Birmingham WFO
NOAA/NWS/Service Hydrologist
NOAA/NWS/Southeast River Forecast Center
NOAA/NWS/Southern Region Climate Services
NOAA/NWS/WFO Peachtree City, GA
NOAA/NWS/WFO Tallahassee
NOAA/Restoration Center
Northwest Florida Water Management District
Southeast Indigenous Peoples' Center
Southern Nuclear
University of Florida
University of Georgia, Athens, GA
University of North Carolina
Upper Chattahoochee Riverkeeper
US Army Corps of Engineers - Mobile District
US Fish and Wildlife Service
USGS/Georgia Water Science Center
USGS/Florida Water Science Center
West Point Lake Coalition